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TITLE PAGE

Title: Enhancing the provision of health and social care in Europe through eHealth.

Running title: Enhancing the provision of health and social care in Europe.

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ABSTRACT

Aim: To report on the outcomes of the European project ENS4Care, which delivered evidence-based guidelines enabling implementation of eHealth services in nursing and social care.

Background: Within a policy context of efficiency, safety and quality in healthcare this project brought together a diverse group of stakeholders from academia, industry, patient and professional organisations to lead the development of five eHealth guidelines in the areas of prevention, clinical practice, integrated care, advanced roles and nurse ePrescribing.

Sources of evidence: Data were collected through a cross-sectional, online, questionnaire survey of health professionals from 21 countries. Quantitative data were analysed using descriptive and summary statistics, while comments to open questions underwent a process of content analysis.

Discussion: Representing an evidence-based consensus statement, the five guidelines outline key steps and considerations for the deployment of eHealth services at different levels of enablement. Through analysis of the data, and sharing of best practices, common deployment processes and implementation lessons were identified.

Conclusion: Findings reveal the richness, diversity and potential that eHealth holds for enabling the delivery of safer, more efficient and patient-centred healthcare. Nurses and social care workers as the main proprietors of such practices hold the key to a healthier future for citizens across Europe.

Implications for Nursing and Health Policy: The preparation, agreement and dissemination of the ENS4Care guidelines will enable European Union leaders to diagnose the organisational changes needed; and prescribe the development of new skills and roles in the workforce to meet the challenge of eHealth. Nurses and social care workers, with the right knowledge and skills will add considerable value and form an important link between technological innovation, health promotion and disease prevention.

Keywords: Advanced Practice Nursing, Clinical Guidelines, Prescribing, Chronic Disease, European Union, Health Informatics, Nursing Care, Social Care

BACKGROUND – the policy context

eHealth is an important enabler of safe, cost-effective, innovative and high-quality healthcare (Sheikh et al. 2011). ENS4Care (Evidence Based Guidelines for Nurses and Social Care Workers for the deployment of eHealth services) was a policy project designed in response to this realisation aiming to promote the deployment of evidence-based eHealth services across the European Union (EU) by frontline healthcare staff, nurses and social care workers in particular (ENS4Care 2015).

EU countries are striving to respond to an increasing public demand for quality, safety, equity and access to healthcare; while concurrently being challenged to innovate regarding the sustainability of their health services (ENS4Care 2015). A way of managing and responding to this challenge is through investing in health and social care workers; developing their skills and enabling them to deliver the care and support that people need (Sheikh et al. 2011). Capitalising on the strengths of the European community, the exchange of high-quality, innovative and cost-effective solutions and approaches is encouraged (ENSCare 2015).

The policy initiatives set out in the European Commission's (EC) Digital Agenda ensure close cooperation between EU member states and different stakeholders, that can act as the driving force to making clear implementation proposals in the field of eHealth (EC 2015). Taking this into account, the EC Directorate General for Communications Networks, Content and Technology (DG CONNECT) published an Action Plan on eHealth 2012-2020 (EC 2012), which focused on interoperability, standards, health literacy and legal clarity around information and communication technology (ICT). Nurses and social care workers were explicitly mentioned: "A significant barrier lies in the lack of awareness of eHealth opportunities and

challenges for users (citizens, patients, health and social care workers)... For professionals (health and scientific communities) the focus will be on developing evidence-based clinical practice guidelines for telemedicine services with particular emphasis on nursing and social care workers” (European Commission 2012:13).

It is widely accepted that successful utilisation of eHealth requires investment in the health and social care workforce (NHS 2014). Political commitment to this is evident in, and stemming from, an EU-US Memorandum of Understanding on cooperation surrounding health related information and communication technologies (European Commission 2010). Here, strategies for development of eHealth proficiencies in the health professional workforce are identified as an issue that holds immediate importance for both parties so that clinicians can fully utilise the potential that eHealth can offer to enhancing their professional experience and performance.

ENS4Care has developed guidelines on the five practice areas of: prevention, clinical practice, integrated care, advanced roles and nurse ePrescribing. These are directed at policy makers, industry organisations and frontline staff; and can be used to enable health system reform by using technology to support the delivery of high-quality and safe health and social care (Hovenga et al. 2013).

METHOD – sources of evidence

Data to inform this policy project were collected through a cross-sectional, online, questionnaire survey. The link to the questionnaire was distributed to potential participants by email, through the ENS4Care project partner organisations. The questionnaire was designed to collect examples of best practices about nurses and/or social workers use of eHealth services; and included both closed and open questions. Participants were invited to submit examples of best practices in one of the ENS4Care

five practice areas.. The survey was managed through the SurveyMonkey platform (www.surveymonkey.com). The questionnaire was launched in February 2014 and remained open until 20th April 2014. All practices were submitted to scrutiny by applying the ENS4Care selection criteria; these were agreed by all ENS4Care partners and included:

1. ICT component: the example or practice shall include the use of ICT technologies supporting the delivery of health and social care.
2. Nurses and/or social care workers: the example or practice needs to be introduced or implemented primarily with nurses' and/or social care workers' involvement.
3. Cost-effectiveness: the example or practice should demonstrate that the services enabled by ICT tools have the potential of providing cost-effectiveness to the health and social care system.
4. Patient empowerment: the example or practice should demonstrate that the services enabled by ICT tools have the potential to improve and empower patients/citizens.
5. Usability and usefulness of the ICT tool/service: the example or practice should demonstrate that the ICT tool is considered to be useful and easy to use by professionals and patients/citizens.
6. Person-centredness, safety and privacy: the example or practice should respect patient (or person) centredness, address issues related to patient safety and respect privacy and associated ethical issues.

In order to make the selection of these practices transparent, standard tabulation techniques were applied whereby each practice was assessed against the above criteria and the extent to which these were fulfilled noted. Practices that met these criteria

were put forward for detailed analysis and discussion within relevant work packages. Final selection of practices was through consensus during an ENS4Care work package leaders' and partners' meeting.

Quantitative data were analysed using descriptive and summary statistics (frequencies, percentages), while comments to open questions underwent a process of content analysis. The analysis process aimed to be objective and impartial; to this end an independent researcher assigned a 'CaseID' and anonymised the practices so that the researcher undertaking the analysis remained blinded to the name and institution from which each submission was made.

The content and sequencing of questions was designed in collaboration between the project partners thus achieving face validity. The questions did not seek responses on sensitive subjects and so ethical risks were deemed to be minimal. However, participants' sensitivities cannot always be predicted and so attention was paid to ensure questions were worded carefully. Return of the questionnaire constituted participant's consent to contribute to the survey. The questionnaire can be made available upon request (from <http://www.ens4care.eu/contact-us/>). As this was a policy project, rather than a research study, formal consideration from an ethics committee was not required.

The analysis revealed common themes that reoccurred in the submissions, such as factors that acted as barriers and facilitators to the success of an eHealth service, as well as common implementation processes. These were taken into account in the development of the guidelines, which were subject to a process of refinement through consultation with the project partners. The final guideline documents are available through the project website, the key messages of which are summarised next.

RESULTS

In total, 121 submissions were made from 21 countries across the ENS4Care project partners (figure 1).

Figure 1: Questionnaire respondents, by ENS4Care partner and Country

The submissions were mainly made by professionals (n=111, 91%), most of them nurses, while nine practices (9%) were also submitted by service users and carers. Most of the submissions were made under the ENS4Care area Clinical practice (n=40, 34%) followed by Integrated Care (n=21, 18%), Prevention (n=20, 17%), Advanced Roles (n=19, 16%) and Nurse ePrescribing (n=17, 15%).

Most of the submitted practices were fully implemented (n=73, 60%). The responses made under geographical coverage indicated that most practices submitted were: Locally based (n=48, 39%); 24% (n=29) at National level, 21% (n=26) at Regional level, 9% (n=11) at International level and 3% (n=3) at European level (Table 1).

Table 1: Geographical coverage of submitted practices

Most of the practices required Internet Connection (n=92, 75%) and more than half (n=70, 57%) referred to Electronic databases. This was followed by use of telephone (n=42, 34%), tablet (n=33, 27%), mobile phone (n=33, 27%), telemonitoring system (n=21, 17%) and smart phone (n=21, 17%).

DISCUSSION – ENS4Care guidelines

Prevention: Non-Communicable Diseases

Presently, 97% of health budgets are spent on treatment whereas only 3% are invested in prevention (EC 2013). Governments, inter-governmental organisations, civil society, corporations, non-governmental organisations, and others play a major role in supporting the prevention agenda. However, securing the active engagement of citizens, families, carers and communities in making healthier choices and adopting health promoting behaviours is fundamental. Cardiovascular disease (CVD) and Non-communicable Diseases (NCDs), such as type 2 diabetes are among the biggest global challenges affecting not only health but also social and economic development. They affect high-, middle- and low-income countries, with the poorest members of society often carrying the heaviest burden. They cost an estimated €700 billion per year in the EU i.e. 70–80% of health care budgets (EC 2013). In particular, CVD is the top cause of death worldwide (Joint British Societies 2014). The increase in obesity and diabetes especially among younger people is likely to contribute significantly to CVD-related mortality in the future. However, it is estimated that much CVD-related mortality (80%) could be avoided through targeting its main causative factors such as smoking, obesity, diabetes, hypertension and dyslipidemia (Lopez-Gonzalez et al. 2013).

eHealth technologies can make a significant contribution to preventing NCDs and empowering citizens to take control of their own health. A wide range of technologies are currently in use to promote health and wellbeing, ranging from simple, free apps which can be downloaded by individuals on their smartphones; to more complex

innovations incorporated into local or national health systems and focused on secondary and tertiary prevention. HeartAge, an online evidence-based tool used for communicating important health information and advice to help prevent CVD is one such example, which the ENS4Care guideline examined. Nurses and social care workers are particularly well placed to assist people in assessing their CVD risk and in motivating and supporting them to change their behaviour, and eHealth services can enable to do just that in a cost-effective and uncomplicated way.

Clinical Practice: Tele-health and tele-monitoring

There is demand for new working methods to meet the current challenges faced by health and social care workers (Heale et al. 2015). Policy-makers in Europe recognise that increased use of ICT in the health and social care sectors can help contain many of the challenges (Danish Regions 2011; Kidholm et al. 2012). While eHealth in clinical practice cannot be viewed as a substitute for the face-to-face contact with professionals that citizens require at times of crisis or during acute phases of their illness, it does have the potential to radically enhance the exchange of information between service users and those concerned with their treatment (ENS4Care 2015).

The collected examples of eHealth services for clinical practice collected through the online survey point towards a large number of different eHealth technologies in use in a variety of care settings. However, the functions of remote monitoring and teleconsultations within the area of chronic diseases account for many of the examples. A prominent example is chronic disease remote monitoring and teleconsultation with discharged citizens affected by COPD. An increasing volume of research shows cost savings by using such services. For instance, emergency department visits, hospital admission rates and deterioration seem to be prevented

(Gaikwad et al. 2009; Haesum et al. 2012; Mistry 2012; Peeters et al. 2011; Wade et al. 2010). Moreover, studies have shown that eHealth reduces travel time for both citizens and health professionals; it reduces waiting times and hospital admissions; and, citizens receive a quicker diagnosis (Darkins et al. 2008).

The use of remote monitoring and teleconsultations means healthcare professionals will have to equip themselves with new skills and adapt their way of working. It is therefore imperative that such systems and the way they are used are acceptable by professionals, as well as citizens. Well-designed systems can improve the delivery of patient focused, evidence-based care and treatment but only live use will indicate whether such systems are fit for the purpose for which they were designed (Royal College of Nursing 2014).

Integrated Care: Pushing for integrated health and social care services

Integrated care refers to the “management and delivery of health and social care services so that citizens receive a continuum of preventive and curative services, according to their needs over time and across different levels of the health system” (European Innovation Partnership on Active and Healthy Ageing 2012:27). It is generally accepted that failure to better integrate or coordinate health and social care services between primary and secondary care can result in suboptimal patient outcomes, such as unnecessary or avoidable hospital re-admissions or adverse drug events (World Health Organisation 2014). The implementation of eHealth services for integrated care holds great potential for improving the safety and quality of care for citizens across the EU, through ensuring continuity of care across primary and secondary health and social care services. This can yield substantial benefits for both citizens (especially for patients) and care providers. Citizens, including patients and

family, can be empowered to take more ownership of their health and illness trajectories while care providers can be enabled to provide the high quality care they aspire.

The submitted practices indicated that potential outcomes of eHealth services for integrated care include increased quality of care, better self-care, satisfaction, efficiency through timely communication and exchange of information between providers, reduction in re-admissions and unnecessary hospital visits, and more effective discharge processes. These outcomes are likely to be cost-efficient and a detailed cost-benefit analysis would help to ensure continued investment. However, attention should also be paid to unintended outcomes such as changes in the relations between care providers. The submissions indicated positive behavioural changes in terms of improved interaction between primary and secondary care teams and more information sharing, more encouragement for multi-professional working and improved communication. eHealth is to be considered as a way to create a different and new relationship between citizens and healthcare professionals that leads to real shared and conscious decisions.

In many countries in Europe integrated care is at the early stages of development, and its impact and outcomes especially in relation to nursing need further study. Nursing sensitive indicators, which reflect the process and outcomes of nursing care, structure and diagnosis should be explored; while interventions and outcomes can be based on the reference terminology model for nurses – International Classification for Nursing Practice (ICNP) and the WHO reference terminology both of which are key to continuity and quality of care. Integrated care can also be part of i-NMDS (International Nursing Minimum Data Set) (ICN 2007; Hannah 2006). The i-NMDS

represents a set of minimum nursing data with uniform definitions and measures, which aims to support benchmarking and international profiling of nursing practice and through this foster the delivery of the high-quality, safe, effective and evidence-based care (International Council of Nurses 2007).

Advanced Practice: Development of advanced roles

The increasing and changing health needs of EU citizens have led to member states considering new ways of organizing and delivering health and social care services. Within a context of tighter health budgets and rising demands for high-quality and safe care, advanced roles for nurses and social care workers are required to make best use of the eHealth developments and enhance quality of care. For the purposes of ENS4Care advanced practice is considered according to the ICN definition and refers to: ‘a registered nurse or social care worker who has acquired the expert knowledge base, complex decision-making skills and clinical competencies for expanded practice, the characteristics of which are shaped by the context and/or country in which s/he is credentialed to practice’ (International Council of Nurses 2008).

Advanced practitioners have a lot to offer as they have knowledge of, and insight into, the entire patient pathway; high level of experience and expertise; additional qualifications and skills to perform tasks such as ordering and interpreting tests and investigations and conducting physical assessments; and considerable knowledge of the healthcare system in which they work and its processes (Health Service Journal 2015). They are therefore ideally placed to innovate and lead the implementation of eHealth.

Whilst nurses, social care workers and other care professionals across Europe already possess well-developed core skills and share values, there is wide variation in the

organisation and management of services and the advanced roles that professionals are increasingly required to undertake in different countries. Examples of these for both nurses and social care workers include those that arise from the need to work in interdisciplinary teams, assess people's requirements holistically and commission and coordinate complex packages of care. The practice of nurse prescribing which has been successfully developed in a number of countries clearly requires advanced skills for nurses, as do the statutory responsibilities of social care workers to carry many jurisdictions for the protection of children and vulnerable adults from abuse.

From a EU perspective, uniformity and harmonisation in the development of advanced roles would benefit from a common education pathway. Education and training are the most significant factors that affect the successful implementation of eHealth (Valta 2013). In particular, a roadmap is needed to guide EU Member States towards an agreement about a common training framework for advanced roles according to the modernised Professional Qualifications Directive (2013/55/EC). The new article 49a on common training frameworks offers an opportunity to extend the existing system of automatic recognition to new professional groups on the basis of such frameworks.

Nursing in particular has already established advanced roles in some EU countries (OECD 2010), although in others this is still in development. Member states would do well to share their experiences of introducing and developing advanced nursing practice (ANP) and aim for: a system of registration underpinned by mandatory regulation of ANP to ensure effective mobility of ANPs without compromising public safety; a robust quality assurance system for all ANP programmes covered by this regulation; a commitment to continuing professional development for ANPs; and, a

clear articulation and understanding of the line of accountability between a registered nurse and an ANP.

Nurse Prescribing: ePrescribing

ePrescribing in Europe is a dynamic activity which is shaped by a number of key facilitators and barriers. Therefore, ePrescribing is best seen as a ‘pathway’ with different gateways which users must progress through in order to achieve effective project deliverables. One illustrative example of this point is the ePrescriber planning toolkit from the United Kingdom’s National Health Service, which identifies a number of key stages required for effective deployment of an ePrescribing programme (NHS 2015).

This fifth ENS4Care guideline describes how and where nurse leaders should begin in order to gain a comprehensive overview of the key processes involved in learning about nurse ePrescribing. Information is presented from three differing perspectives – organisational or enterprise view, clinical view, and informatics view – in order to demonstrate a roadmap that highlights the point that all phases of development need to be considered collectively and sequentially rather than in an ad hoc way (ENS4Care 2015).

Three key critical factors should be borne in mind in the initial stages of planning for nurse ePrescribing. First, jurisdictional factors and prescriptive authorities will guide care flow for nursing practitioners in ePrescribing and need to be clearly thought out. Although prescribing has been introduced in a number of countries in recent years, the legal practice of prescribing by nurses varies considerably by country (Kroezen et al. 2011). Second, informatics infrastructure and platform development is crucial to address issues with semantic and syntactic interoperability. This is especially

important in recognition that future nurse ePrescribing will more than likely occur within a multi-disciplinary Electronic Health Record. Third, competency in clinical decision-making must be addressed. Educational and training programmes on medication management as well as informatics training for nursing and social care workers are paramount. Medication management requires prescribers to adhere to electronic prescribing and administration of medication, as well as medication optimisation to ensure clinical effectiveness is achieved as part of a patient-focused, outcome-based service. Nurse prescribers will need to use clinical judgement within their scope of practice underpinned by research and evidence.

CONCLUSION

Europe's shifting demographics, alongside a need to provide cost-effective healthcare, suggest that eHealth will play a critical part in the delivery of high-quality health and social care (Royal College of Nursing 2012). Nurses and social care workers, with the right knowledge and skills will add considerable value and form an important link between technological innovation, health promotion and disease prevention. The ENS4Care guidelines can help to ensure that eHealth services retain their flexibility in order to satisfy changing healthcare budgets, in addition to the EU's shifting health and illness patterns.

The examples of best practices collected through the ENS4Care survey and the experience of the project partners give credence to published reports that identified a number of aspects that need to be considered when implementing eHealth services (McLean et al. 2011). For example, implementation of eHealth services does not only affect the involved health and social care workers (Checkland et al. 2008; Grant et al.

2009; Segar 2013), but the entire organisation (Lamothe et al. 2006). Implementation of eHealth can result in new units and different structures for internal communication; deployment of new staff living far away from the working place; a different and more positive attitude towards technology; and, changed patient flow through the department and better care and treatment (Lamothe et al. 2006).

Implementation of eHealth services also requires a change of working routines and organisation. It is necessary to secure the required time for planning and education of the new service, and appropriate resources must be available. It may also lead to task shifting (Aas 2001) and the pressures this introduces need careful managing. Finally, eHealth can also enable the release of specialist resources. Clinical specialists avoid expensive transportation and waiting times, and the scheduled consultations/contacts can bring about higher flexibility and constitute an advantage for citizens (Wootton 2011).

IMPLICATIONS FOR NURSING AND HEALTH POLICY

The analysis of the questionnaire data and shared experience among the project partners has revealed a number of policy implications. These can be identified at different levels and directed at: policy makers, local implementers, professional associations and nurse and social care workers (Table 2).

Table 2: Implications for Nursing and Health Policy

At a policy level, decision makers need to be aware that eHealth services and tools should be user friendly, cost effective, integrated with existing systems, aligned with existing policies and act to complement rather than replace face-to-face contact with professionals. Moreover, at the level of implementation, local commissioners would do well to keep in mind that: implementation of eHealth services is likely to temporarily disrupt usual practice and so a strong leadership presence is essential through the implementation stage; that staff require clear and accessible document to guide them in how to use such services; and that key indicators and outcome need to be considered carefully and collected throughout the process.

In addition, professional associations and regulatory bodies must note that: there is a need to clarify professional boundaries within which advanced professionals will employ eHealth solutions; that development of a career pathway for nurses and social care workers with appropriate associated remuneration to accompany the increase in responsibility related to eHealth is key; and that jurisdictional factors, prescriptive authorities, informatics infrastructure and competency in clinical decision-making should be considered in the initial stages of planning for nurse ePrescribing.

Finally, nurses and social care workers should be supported to assess the eHealth literacy levels of patients, carers, families and communities to ensure that they are enabled to harness and gain maximum benefit from changing technologies; should have the knowledge, skills, opportunities and capacity to use the tools and technologies effectively; and should empower service users to participate in the implementation and monitoring of their own service and treatment measures of care, as well as in the decision-making processes concerning these.

The ENS4Care project has demonstrated the benefits that can be gained by combining evidence-based practice and expertise from a diverse range of stakeholders, leading to valuable lessons for real-world implementation. Policy makers, professional associations and health professionals would do well to use these lessons as a guide to sensible decision-making and to inform the development of a common approach. Patients and citizens may also benefit by engaging with the implementation phase of ENS4Care, through raising their awareness of the options and pathways available to organise the delivery of their health and social care. In this way patients and individuals across Europe can be empowered to input into shaping their local health service and take charge of their health and illness trajectories.

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FIGURES

Figure 2: Questionnaire respondents, by ENS4Care partner and Country

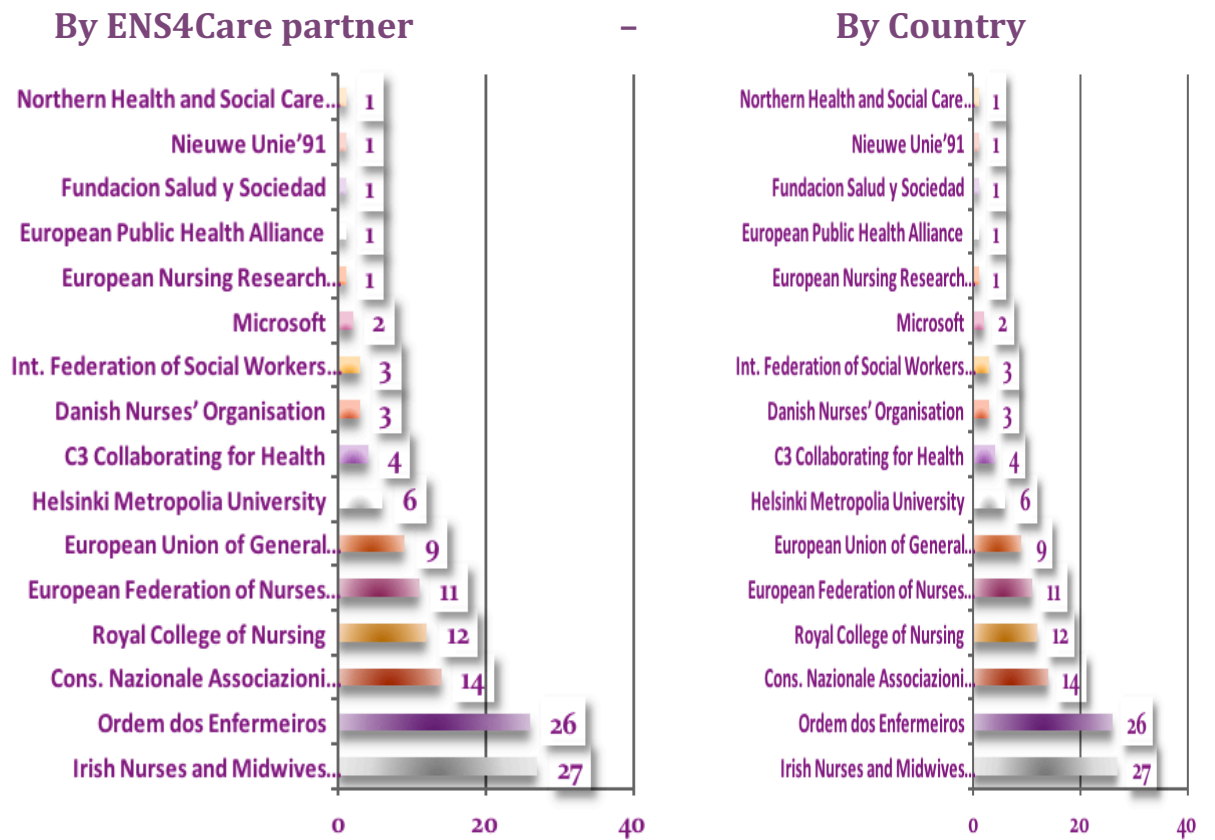


Figure 2: Practices submitted by ENS4Care area:

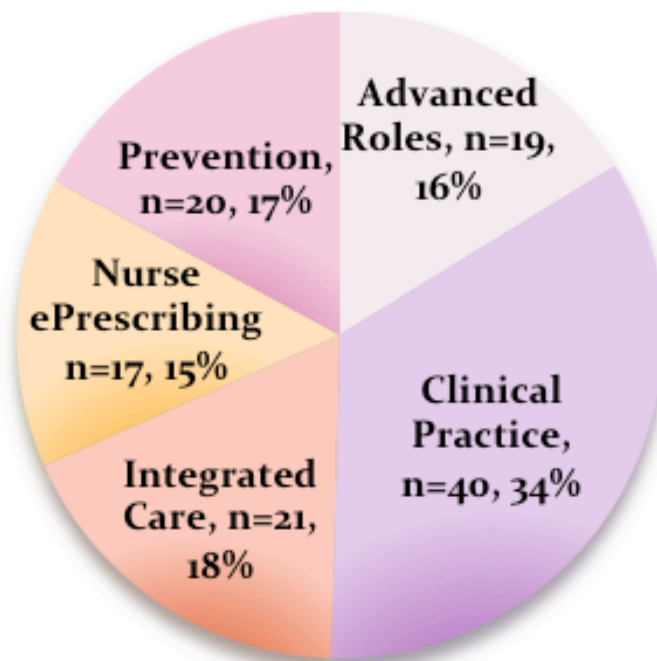
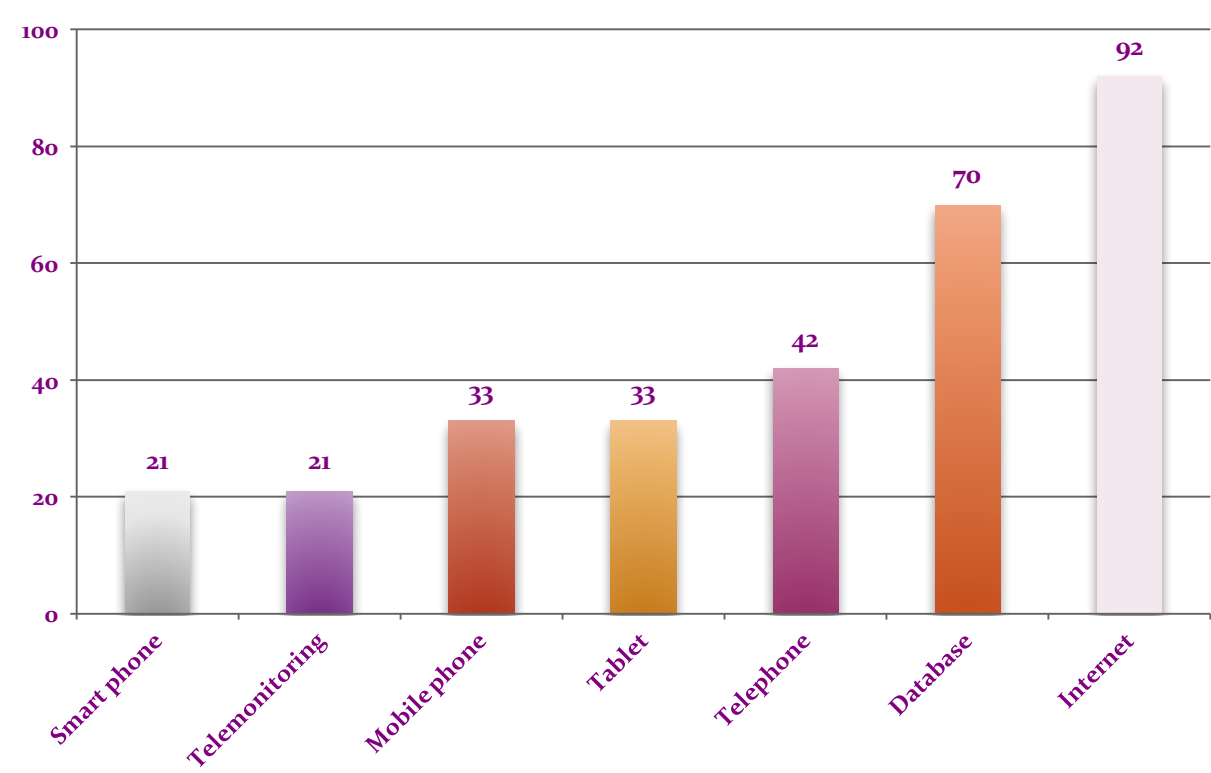


Figure 3: Kind of ICT used in the submitted practices



TABLES

Table 1: Geographical coverage of submitted practices

Response	Percentage	Count
European	3%	3
International	9%	11
Regional	21%	26
National	24%	29
Local	39%	48
No indication	4%	5

Table 2: Implications for Nursing and Health Policy

At policy level, decision makers need to be aware that eHealth services and tools should be:	At the level of implementation, local commissioners would do well to keep in mind that:	Professional associations and regulatory bodies must note:	Nurses, as well as social workers should be supported to:
<p>a) user friendly for all those involved including the patients, carers, the public as well as health professionals;</p> <p>b) assessed for cost effectiveness;</p> <p>c) comply with local and national policies and structures - in relation to data protection, patient confidentiality and privacy, as well as legal and governance requirements;</p> <p>d) well integrated with existing IT systems so they can be easily accepted and used by staff;</p> <p>e) a complement but not a substitute for the face-to-face contact with health and social care professionals that citizens require at times of crisis or during acute phases of their illness.</p>	<p>a) a strong leadership presence is essential through the implementation stage of all eHealth services;</p> <p>b) consideration needs to be given to the development of clear and accessible staff documentation such as instruction manuals, guidelines and protocols;</p> <p>c) consideration should be given to establishing a single point of contact for staff support i.e. a kind of a ‘super-user’, who can respond to issues, troubleshoot and offer advice;</p> <p>d) evaluation processes should identify changes in key indicators that would reveal areas where the eHealth service has positive or negative impact;</p> <p>e) outcome data should be collected throughout the process as well as indicators of success, which should include: satisfaction with care, re-admission rates and average length of stay in hospital.</p>	<p>a) there is a need to clarify professional boundaries within which advanced professionals will employ eHealth solutions;</p> <p>b) development of a career pathway for nurses and social workers with an appropriate associated remuneration to accompany the increase in responsibility related to eHealth is key;</p> <p>c) there is a clear need to establish transparent funding processes to support advanced professional posts;</p> <p>d) jurisdictional factors, prescriptive authorities, informatics infrastructure and competency in clinical decision-making should be considered in the initial stages of planning for nurse ePrescribing.</p>	<p>a) assess the health literacy levels of patients, carers, families and communities to ensure that they are enabled to harness and gain maximum benefit from changing eHealth technologies;</p> <p>b) have the knowledge, skills, opportunities and capacity to use the tools and technologies effectively;</p> <p>c) empower service users to participate in the implementation and monitoring of their own service and treatment measures of care, as well as in the decision-making processes concerning these.</p>